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Covidien LP
ATTN: IP Legal
6135 Gunbarrel Avenue
Boulder, CO 80301

EXAMINER	
NEGIN, RUSSELL SCOTT	

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JAMES WATSON and PAUL STANLEY ADDISON

Appeal 2016-007439[1]
Application 12/249,053
Technology Center 1600

Before RICHARD M. LEBOVITZ, FRANCISCO C. PRATS, and DAVID COTTA, *Administrative Patent Judges*.

LEBOVITZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal involves claims directed to systems for signal processing, a computer-readable medium, and methods for processing of a two dimensional signal. The Examiner rejected the claims under 35 U.S.C. § 101. We have jurisdiction under 35 U.S.C. § 6(b). The rejection is affirmed.

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[1] The Appeal Brief ("Appeal Br.") 3 lists Nellcor Puritan Bennett LLC, the Assignee of the above-referenced application, and its parent company, Medtronic PLC, as the real-parties-in-interest.

STATEMENT OF THE CASE

Appellants appeal from the Examiner's final rejections of claims 1, 3–13, 16–27, 29, and 30 under 35 U.S.C. § 101 as being directed to an abstract idea which is ineligible subject matter for a patent. Final Action 3 ("Final Act."; Mar. 20, 2015). Obviousness rejections of the claims were withdrawn by the Examiner in the Answer. Answer 2 ("Ans."; June 16, 2016).

There are three independent claims on appeal, claim 1 directed to a method for processing a two-dimensional signal, claim 13 is to a system for signal processing, and claim 27 to a non-transitory computer readable medium storing instructions for signal processing. Each of the claims has substantially the same limitations in the form appropriate to its statutory class of invention.

CLAIMS

The claims were not argued separately. Consequently, we have selected claim 1 as representative. Claims 3–13, 16–27, 29, and 30 fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv). Claim 1 reads as follows (the steps have been numbered [1]–[6] for reference):

> 1. A method for processing a two-dimensional signal, comprising:
>
> [1] receiving the two-dimensional signal comprising at least one repetitive component, wherein the two-dimensional signal comprises a photoplethysmograph (PPG) signal received from a sensor comprising at least one emitter and at least one detector;
>
> [2] identifying, using a processor, a plurality of features of the two-dimensional signal corresponding to the at least one repetitive component;
>
> [3] identifying, using a processor, a plurality of segments of the two-dimensional signal, wherein each of the segments

> comprise starting and ending points generally adjacent to the plurality of identified features;
>
> [4] transposing, using a processor, the plurality of segments to form a three-dimensional stack of the plurality of segments, wherein the starting points of the plurality of segments in the three-dimensional stack are adjacent to each other along an axis;
>
> [5] deriving, using the processor, respiration information based at least in part from the three dimensional stack of the plurality of segments; and
>
> [6] displaying, using a display, the respiration information.

Claim 1 is drawn to a "method for processing a two-dimensional signal." The claim has six steps which are numbered [1]-[6] herein. In the first step, a two-dimensional signal from a photoplethysmograph (PPG) is received. A "plethysmograph is an instrument that measures physiological parameters, such as variations in the size of an organ or body part, through an analysis of the blood passing through or present in the targeted body part." Spec. ¶ 23. The Specification defines a PPG signal as a "signal representing light intensity versus time or a mathematical manipulation of this signal (*e.g.,* a scaled version thereof . . . etc.)." *Id.* at ¶ 25.

Steps [2]–[5] of the claim use a "processor" to "identify" components of the signal (features, segments), to "transpose" the identified segments to form a stack of segments, and to "derive" respiration information from the stack of segments. In the final step [6] of the claim, the respiration information is displayed.

REJECTION

The Examiner found that the claim is directed to patent ineligible subject matter under 35 U.S.C. § 101 because it is directed to an abstract idea of processing PPG signals on a processor, which constitutes a judicially recognized exception to the statute. Final Act. 3. The Examiner found that the additional elements recited in the claim do not "provide meaningful limitation(s)" which transform the abstract idea into a patent-eligible application of the idea. *Id.*

Appellants contend that the claims are not directed to an abstract idea, and even if they are, the "claims comprise additional elements that amount to significantly more than an abstract idea itself." Appeal Br. 16. Appellants also contend that the Examiner did not set forth adequate evidence that the claims are directed to an abstract idea. *Id.*

DISCUSSION

To determine whether a claim is eligible for patent under 35 U.S.C. § 101, a two-step analysis is necessary. As set forth in *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2355 (2014):

> First, we determine whether the claims at issue are directed to one of those patent-ineligible concepts [e.g., a law of nature, natural phenomenon, or abstract idea]. If so, we then ask, what else is there in the claims before us? . . . We have described step two of this analysis as a search for an inventive concept—i.e., an element or combination of elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.

Id. (alterations, citations, and quotation marks omitted).

The method of claim 1 comprises receiving a signal from a PPG and processing the signal on a processor to derive respiration information based

on features and segments identified by the processor. A processor is described in the Specification as "any suitable software, firmware, and/or hardware, and/or combinations thereof for processing signal." Spec. ¶ 49. As examples, the Specification states a processor "may include one or more hardware processors (e.g., integrated circuits), one or more software modules, computer-readable media such as memory, firmware, or any combination thereof." *Id.* In other words, the PPG signal processing can be performed on a conventional computer.

The method claims further comprise identifying components of a signal received from a PPG and processing the components to derive respiration information. As explained in the Specification:

> In one embodiment, transposing the plurality of segments of the signal to form a stack of segments includes aligning each subsequent segment next to the previous segment along a first axis. The length of each segment extends along a second axis that is perpendicular to the first axis. The amplitude of the each segment is represented in a third axis that is perpendicular to the first axis and the second axis. In one such embodiment, deriving the information includes detecting local maxima across either the first axis or the second axis of the stack to identify ridges. The ridges may then be analyzed to determine differential phase effects of respiration on a segment.

Spec. ¶ 5.

The recited steps [2]–[5] of signaling processing constitute an algorithm because they provide the instructions which enable one of ordinary skill in the art to utilize the signals from a PPG to obtain information about respiration, such as individual breaths (recited in dependent claim 3) and a respiration rate (recited in dependent claim 4). The algorithm is an "abstract idea," and a judicial exception to Section 101, because it is not associated with a concrete object, but rather it is a

mathematical process that operates on a signal representing light intensity over time (Spec. ¶ 25). In our opinion, the respiration algorithm of the claim is analogous to the mathematical formula in *Parker v. Flook*, 437 U.S. 584 (1978) and the algorithm in *Gottschalk v. Benson*, 409 U.S. 63 (1972), both which were found to represent abstract ideas.

Appellants contend that the claimed method does not "preempt the use of an algorithm" and "are of modest scope, and thus do not threaten to create problems relating to preemption." Appeal Br. 18–19.

In *Alice*, the Court "described the concern that drives this exclusionary principle [of laws of nature, natural phenomena, and abstract ideas] as one of pre-emption." *Alice*, 134 S. Ct. at 2354.

In this case, the claims involve identifying features and segments of a signal from a PPG, processing these components to form a three-dimensional stack, and deriving respiration information from the stack. The claimed algorithm pre-empts all uses of features, segments, and three-dimensional stacks to determine respiration information from a PPG signal. While the claim is drawn to the narrow use of the algorithm to analyze PPG signals, this is the only disclosed use for the algorithm. Thus, the claim "wholly pre-empt[s]" the algorithm's use because the only practical application of it is in the field of PPG technology. *See Bilski v. Kappos*, 130 S. Ct. 3218, 3230 (2010) ("As the Court later explained, *Flook* stands for the proposition that the prohibition against patenting abstract ideas 'cannot be circumvented by attempting to limit the use of the formula to a particular technological environment' . . .") ("even if the solution is for a specific purpose, the claimed method is nonstatutory." *Parker v. Flook,* 437 U.S. 584, 595, 98 S. Ct. 2522 (1978)).

The absence of total preemption, moreover, does not show that a claim is eligible for patenting under § 101. *See Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) ("While preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility. . . . Where a patent's claims are deemed only to disclose patent ineligible subject matter under the *Mayo* framework . . . preemption concerns are fully addressed and made moot.").

The second step of the patent eligibility analysis requires a determination of whether the claims do significantly more than simply describe the abstract idea or natural law. *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289, 1297 (2012). The claim limitations must be scrutinized to determine whether the claims contain an "inventive concept" to "transform" the claimed abstract idea or natural law into patent-eligible subject matter. *Alice*, 134 S. Ct. at 2357 (*quoting Mayo*, 132 S. Ct. at 1294, 1298).

> The transformation of an abstract idea into patent-eligible subject matter "requires more than simply stat[ing] the [abstract idea] while adding the words 'apply it.'" *Id.* (quoting *Mayo*, 132 S.Ct. at 1294) (alterations in original). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* (quoting *Mayo*, 132 S.Ct. at 1297) (alterations in original). Those "additional features" must be more than "well-understood, routine, conventional activity." *Mayo*, 132 S. Ct. at 1298.

Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 715 (Fed. Cir. 2014).

In this case, the steps of [1] "receiving" the two-dimensional PPG signal and [6] "displaying, using a display, the respiration information" are

routine, conventional activity. It is necessary to receive the signal to perform the recited algorithm of steps [2] through [5]. The claim does not specify how the "receiving" is accomplished, but rather it is recited generically and can include any way in which data is received by a processor. The displaying step is also generic, including conventional techniques through which processed information is displayed to a user.

We recognize that the combination of steps of the claimed algorithm of steps [1]–[5] is not taught in the prior art of record as evidenced by the Examiner's withdrawal of the obviousness rejection of the claims. However, the issue is not whether the claimed abstract idea is non-obvious, but whether the application of the abstract idea constitutes more than just routine activity.

> Without additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible. "If a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory." *Parker v. Flook,* 437 U.S. 584, 595, 98 S.Ct. 2522, 57 L.Ed.2d 451 (1978) (internal quotations omitted).

Digitech Image Technologies LLC v. Electronics for Imaging Inc., 758 F.3d 1344, 1351 (Fed. Cir. 2014).

The requirement in the claims that the signal is processed using a "processor," which we find to include a generic computer, does not change our conclusion that the claim reads on patent ineligible subject matter.

> The introduction of a computer into the claims does not alter the analysis at *Mayo* step two. In *Benson,* for example, we considered a patent that claimed an algorithm implemented on "a general-purpose digital computer." 409 U.S., at 64, 93 S.Ct. 253. Because the algorithm was an abstract idea, see *supra,* at

> 2355, the claim had to supply a " 'new and useful' " application of the idea in order to be patent eligible. 409 U.S., at 67, 93 S.Ct. 253. But the computer implementation did not supply the necessary inventive concept; the process could be "carried out in existing computers long in use." *Ibid.* We accordingly "held that simply implementing a mathematical principle on a physical machine, namely a computer, [i]s not a patentable application of that principle." *Mayo, supra,* at ——, 132 S. Ct., at 1301 (citing *Benson, supra,* at 64, 93 S. Ct. 253).

Alice, 134 S. Ct. at 2357–58.

Appellants contends that their claims are patent eligible under 2014 USPTO guidelines because they are an improvement to the field of PPG respiration monitoring. Appeal Br. 20; Reply Br. 3. This argument is not persuasive. In *Amdocs (Israel) Limited v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300–01 (Fed. Cir. 2016), the claims were found to be patent eligible under 35 U.S.C. § 101 because "the claim's enhancing limitation necessarily requires that these generic components [network devices, etc.] operate in an unconventional manner to achieve an improvement in computer functionality." However, here the improvement identified by Appellants is not to the device itself, but rather to the algorithm used to process the signal and derive respiration information. Thus, the rejected claims are distinguishable from the claims in *Amdocs*.

Appellants also cite *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016) as supporting the patent eligibility of the claims. In *Enfish*, the court found that "the claims at issue . . . are not directed to an abstract idea within the meaning of *Alice*. Rather, they are directed to a specific improvement to the way computers operate, embodied in the self-referential table." *Id.* at 1336. The claims in this appeal are not an improvement to how a computer operates or how a PPG operates. As already discussed, the

improvement is to an algorithm for processing a signal and does not improve a computer as in *Amdocs* and *Enfish*.

Appellants contend:

> [The] combination of elements in the currently pending claims imposes meaningful limits on the scope of the claims because each of the pending claims recites a method for or a processor capable of receiving and processing a PPG signal from a specific sensor that comprises at least one emitter and at least one detector.

Appeal Br. 19.

To support this position, they cite *SiRF Technology Inc. v. International Trade Commission,* 601 F.3d 1319 (Fed. Cir. 2010):

> The Federal Circuit held that a device capable of receiving a GPS signal (*i.e.,* a GPS receiver) was integral to the claims and provided a "meaningful limit on the scope of the claims" because it "play[[ed]] a significant part in permitting the claimed method to be performed." *Id.* at 1332-1333.

Id.

SiRF was decided before *Mayo* and *Alice* and thus did not have the guidance provided by those cases. It is therefore not clear that *SiRF* was decided under the proper test. *See*, *SiRF*, 601 F.3d at 1332. Nonetheless, in *SiRF*, the GPS receiver was considered to place a meaningful limitation on the claim because "without a GPS receiver it would be impossible to generate pseudoranges or to determine the position of the *GPS receiver* whose position is the precise goal of the claims." *Id*. The algorithm in *SiRF* was used to determine the position of the GPS receiver. The claims in this case are distinguishable because the algorithm, while receiving data from a device, namely the PPG, has no application to the operation of the PPG. Rather, the algorithm is used to deduce information about respiration.

For the foregoing reasons, we affirm the Examiner's rejection of claim 1 as ineligible for a patent under 35 U.S.C. § 101. Claims 3–13, 16–27, 29, and 30 were not argued separately and fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

TIME PERIOD

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED